Bell Labs' all-silicon base-station receiver

At the *International Solid-State Circuits Conference* in February, researchers Jenshan Lin, Olga Boric-Lubecke and Penny Gould at Lucent Technologies' Bell Labs (Murray Hill, NJ, USA) claimed they had created the first all-silicon receiver for cell-phone base-stations. Consisting of just three silicon chips), it is 100 times smaller than receivers compising 10-20 GaAs ICs (allowing less obtrusive siting, e.g. behind billboards or on top of utility poles) and 10-100 times less expensive to manufacture. Also, integration of a base-station radio receiver and digital signal processor on a single chip could further reduce base-station cost and move closer to a system-on-a-chip.

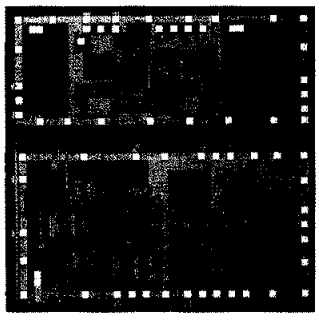

Photo of Bell Labs' all-silicon integrated base-station RF receiver.

Celeritek second-sourcing from GCS

To allows "greater flexibility in responding to the dynamic wireless telecommunications market" (CDMA and W-CDMA), Celeritek Inc (Santa Clara, CA, USA) has signed a 3-year contract to outsource a "significant percentage of wafer manufacture" to pure-play wafer foundry Global Communication Semiconductors Inc (Torrance, CA, USA).

GCS will provide "[" GaAs HBT and pHEMT wafers for various products running concurrently in the Celeritek manufacturing line.

"We have been working closely with GCS for over one year now," said Perry A Denning, vp and general manager of Celeritek's Semiconductor Division. GCS currently offers HBT and PHEMT foundry service for both InGaP and InP processes.

Additionally, GCS is delivering optoelectronic devices such as VCSEL and PIN diodes for fibre communication market and is providing SAW filter foundry service for handset applications.

Flip-chip patent

Microsemi Corp (Santa Ana, CA, USA) has been awarded a US patent for its monolithic microwave surface mount (MMSM) semiconductor packaging - high-speed hermetic flip-chip technology that eliminates the use of ceramic and metal packages for components operating at frequencies up to 12 GHz (as well as parasitics from wire bonding).

Microsemi will also sample (by June) a line of products based on both MMSM and its Enhanced Performance Surface Mount packaging technique (a multi-chip microwave capability called NanoMounts). This can incorporate complete antenna switches for single- or multi-pole applications such as 802.11a and 3G base-stations.

In addition, research is aiming to extend MMSM to InGaAs/InP PIN photodetectors (for 40Gb/s optical transponders).

"At the end of March Microsemi began shipping its first GaAs devices, three months ahead of schedule. Initial orders are for the InGaAs/InP photodetectors launched last December, to be used in DWDM transponders.

Photo of Microsemi's newly patented Monolithic Microwave Surface Mount hermetic flip-chip package for frequencies up to 12 GHz (shown resting on a coin, to indicate the scale).

"We're especially pleased by the early progress of our diversity into several new compound semiconductor products", says president and CEO Jim Peterson.

Microsemi's range now includes InGaP HBT gain blocks and power amplifiers, InGaAs/InP and GaAs photodetectors, and SiC Schottky diodes.